

Task Force 02

SUSTAINABLE CLIMATE ACTION AND INCLUSIVE JUST ENERGY TRANSITIONS

Facilitating a Just Transition for SMEs by Automating Data Collection and Leveraging Digital Sustainable Finance

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Abstract

A just energy transition requires building the carbon accounting capabilities of millions of small and medium enterprises (SMEs) globally and linking this to the financing of net zero transition pathways. SMEs account for at least 50% of greenhouse gas (GHG) emissions of the business sector. Automated carbon accounting is one of the few viable options for SMEs to not lose out on contracts with global clients that have set net zero supply chain targets, when SMEs struggle with low margins and limited time. 66% of the revenue of the world's 2,000 largest companies are now covered by a net zero target, and they increasingly need to disclose scope 3 carbon emissions to respond to regulatory requirements such as the European Union's Corporate Sustainability Reporting Directive and voluntary standards such as the S2 sustainability accounting standard introduced by the International Sustainability Standards Board. There is a risk that SMEs with limited capabilities in carbon accounting will not be eligible for contracts as global corporations respond to new scope 3 disclosure requirements. Moreover, without carbon accounting, SMEs are likely to pay a higher risk premium on bank credit and get excluded from cheaper green and transition finance.

Open banking and open finance digital infrastructure hold great potential for automating data collection and analysis and supporting a just energy transition for SMEs. This policy brief outlines the opportunities for leveraging artificial intelligence (AI) on open banking data for automated carbon accounting for SMEs and linking transaction data to emission factor datasets or real data from e.g. energy meters. It discusses options available for G20 policy makers to design national data ecosystems composed of open banking, open finance, and green data sets as a data infrastructure pillar in their roadmap for a just energy or green transition with the goal of facilitating access to transition finance

for SMEs. It also discusses options for adding further carbon footprint elements to the SME GHG inventory beyond energy.

Keywords: Just energy transition, automated carbon accounting, S2, scope 3, digital data infrastructure, open banking, digital economic activity data.

Diagnosis of the Issue

There were around 332.99 million SMEs worldwide in 2021 (Dyvik 2023), the majority of which are in Asia and Africa. Although SMEs collectively account for at least 50% of GHG emissions of the business sector globally, only 10% measure their GHG emissions (OECD 2022). In the SME Climate Hub 2023 Survey, 55% of SMEs identified a lack of funding as a key obstacle to climate action (SME Climate Hub 2023). Nearly 70% stated that they need additional funds to take climate action. A recent survey among 2,142 SMEs in the European Union shows that of the SMEs that have invested in their sustainable transition only 16% of the external financing used can be classified as sustainable finance (Eurochambers and SMEunited 2023). Emissions reporting is a burdensome process, especially for time constrained SMEs struggling with small profit margins.

GHG accounting is increasingly becoming a minimum condition for SMEs to participate in global supply chains. Net zero policies are re-shaping global supply chains and failure to transition can result in exclusion of SMEs. A survey reveals that 78% of multinational corporations are planning to remove suppliers that endanger their carbon transition plan by 2025 (Standard Chartered 2021). Multinational corporations expect to exclude 35% of their current suppliers as they transition away from carbon. Also, 57% of multinationals are willing to replace emerging market suppliers with ones in developed markets that are less reliant on fossil fuels if it would help them reach net zero. This puts export earnings at risk, as shown in Table 1 for twelve markets.

TABLE 1: Annual export revenue of SMEs at risk in selected countries (USD billion)

Country	Annual export revenue at risk
China	512.3
India	273.7
Hong Kong	205.5
Singapore	146.6
South Korea	142.5
United Arab Emirates	119.6
Malaysia	65.3
Nigeria	34.3
South Africa	33.7
Indonesia	25.6
Bangladesh	18.7
Kenya	3.9

Source: Adapted from Standard Chartered (2021)

SMEs need access to finance to align with net zero supplier requirements. A lack of data infrastructure to automatically generate SMEs’ GHG footprints slows down the development of green credit markets for SMEs. Acceleration of green and transition finance for SMEs requires a better availability of SME’s GHG data, which can be enabled at low costs through digital data infrastructure. Open banking is a key digital data infrastructure making SME expenditure data available to serve as input into algorithms using a spend-based carbon accounting methodology. To move towards a more accurate automated carbon SME footprint there is a need to progressively include activity-based SME data. Activity-based carbon accounting requires data on kilowatt hours energy consumed split by energy type or kilograms of materials purchased.

The current state of the automated GHG accounting solution landscape reflects the availability or not of underlying data infrastructure to perform GHG calculations. It is possible to classify this GHG tech solution landscape into four main types of solutions (Figure 1). The least automated solution type (solution type 1) is carbon calculators in the form of web-based tools requiring SMEs to manually input data to fully automated software solutions harvesting expenditure and activity data with the only SME input being consent to data sharing.¹ Each data input on business activity and/or expenditure is paired with a corresponding emission factor or information on energy mix, which generates the calculation of a total carbon footprint.

Solution type 2 is an automated spend-based carbon accounting solution leveraging SME transaction data. Using merchant codes to classify an expenditure to a sector, it automatically ascribes a quantity of carbon dioxide equivalents (CO₂e) per monetary unit of SME expenditure.² This solution depends on SME expenditure data being available either through open banking or via holding an account relationship with the SME.

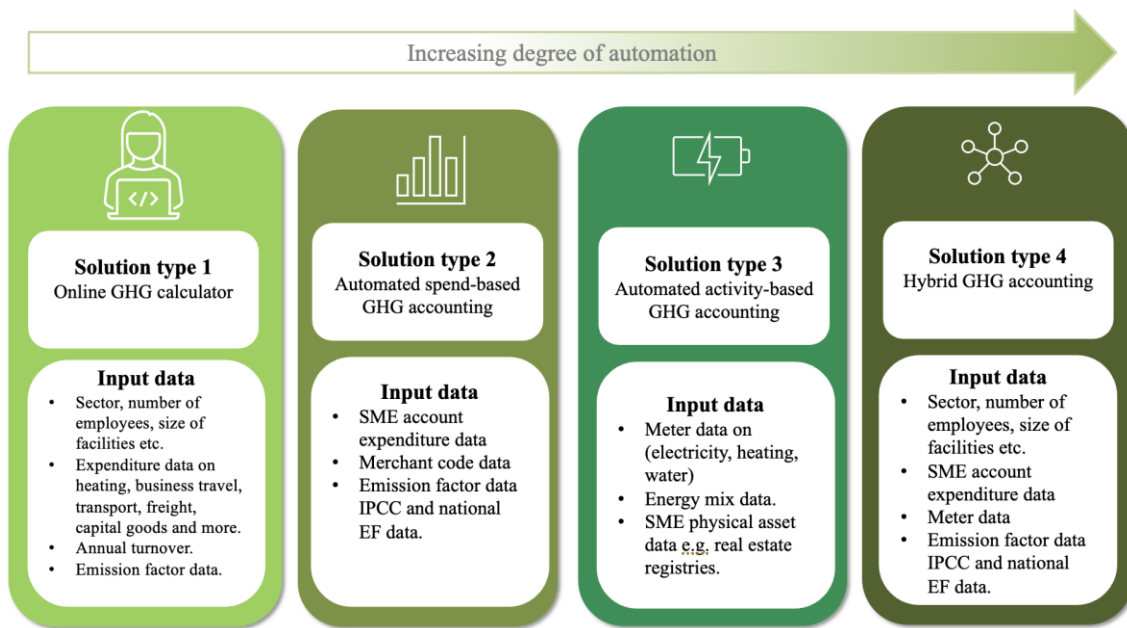
Solution type 3 is automated activity-based GHG accounting for CO₂e footprint of energy use, which depends on access to data from the real economy, such as smart meter data on SME energy consumption and energy mix.

Solution type 4 is a hybrid GHG accounting methodology, combining activity, expenditure and physical asset data feeds that are automatically harvested as well as manually uploaded by the SME.

¹ An example of such a carbon calculator is the one offered by the [SME Climate Hub](#).

² CO₂e is used to convert emissions of greenhouse gases other than carbon dioxide (CO₂) to the equivalent amount of CO₂, based on their relative contribution to global warming (UN-REDD 2024).

FIGURE 1: Classification of automated SME GHG accounting solutions



Source: Compiled by authors.

Web-based carbon calculators where SMEs manually upload data can be easily implemented across jurisdictions but require more effort from the SME and will not easily allow for monitoring of key performance indicators (KPIs) on changes in energy consumption tied to green credit. Solution type 2 is mainly available to SMEs in jurisdictions with open banking infrastructure. Type 3 solution is currently in an early stage of development in a small number of jurisdictions with a penetration of smart meters.

Recommendations

Through the Sustainable Finance Working Group, the Digital Economy Working Group and the Energy Transitions Working Group, the G20 is well positioned to develop a strategic data infrastructure roadmap to unlock SME finance for a just energy transition. We recommend five policy actions which the G20 can help to coordinate and accelerate.

i) Make just SME transition finance a strategic objective of next generation open banking: Data is a strategic asset to unlock a just energy transition. AI enabled GHG accounting needs to be undertaken with country-specific emission datasets per sector and economic activity. As of February 2024, open banking frameworks are being developed across 69 jurisdictions to enable data sharing (Velázquez 2024), creating the option of software development for automated SME GHG accounting. However, few open banking regulations and national FinTech strategies have decarbonisation of SMEs as a strategic objective. One exception is the ‘FinTech 2025 and digitization’ strategy of the Hong Kong Monetary Authority, which includes the establishment of a next generation of open banking infrastructure, the Commercial Data Interchange (CDI), specifically designed to ease credit access for SMEs.³ CDI moves beyond account data to also enable financial institutions to retrieve enterprise data from utility companies, e-commerce platforms, payment gateway providers and more. The G20 can develop a stocktake of open banking frameworks and FinTech strategies to identify best practices in designing these with an explicit intention to unlock just climate transition finance for SMEs.

³ <https://cdi.hkma.gov.hk/about-cdi/>

ii) Integrate economic activity data infrastructure into a just green financial data

ecosystem: Open banking frameworks with the intention to support a just transition need to be part of a larger green and financial data infrastructure model. Moving towards integration of economic activity data, such as energy use data from smart meters, as part of such a model will enable banks and SMEs to access more accurate GHG footprint information which can be directly linked to sustainable finance taxonomies which are all structured according to economic activities.⁴ At present, banks need to make agreements with many utilities to access SME energy data from smart meters. Negotiations to access such data can be time consuming and may discourage banks. Some jurisdictions are designing energy data lakes (such as Elhub in Norway and Perseus in the United Kingdom) to make it possible for all energy market participants to share data.⁵ Perseus is the only data infrastructure in development specifically for the use case of SME climate finance. These data lakes can be used via a single agreement with the data lake to call energy data via a corresponding Application Programming Interface rather than having to engage with hundreds of utilities. The G20 should identify policy avenues to incentivise energy data sharing in ways that does not jeopardise SME competitiveness by using privacy enhancing technologies.

⁴ See, for instance, the [South Africa Green Finance Taxonomy](#), the [European Union's Taxonomy for Sustainable Activities](#), or the [Columbian Green Taxonomy](#).

⁵ [Elhub](#) is a data hub which handles all meter data and market processes in the Norwegian power market. Elhub supports the distribution and aggregation of meter readings for all consumption and production in Norway. [Perseus](#) seeks to unlock access to transition finance for every SME business in the UK by automating sustainability reporting.

iii) Enable linkages of meter data with a network of asset registries: Linking smart meters to SMEs requires an ability to link a unique company identifier to energy meters.⁶ Smart meter data linked to the SME real estate assets via real estate registries coupled with local weather data from metrological databases can enable remote identification of the causes of energy inefficiencies (including lack of air tightness, insulation, or behaviours), which are insights that can guide the design of a renovation package for SME green or transition financing. The latter use case requires high frequency energy consumption data. It also requires data on the size of the building either from the bank loan book or from the real estate registry (NEEM, 2021). However, it requires that SME unique codes are available for the database linking, something policy makers and national statistical office can enable.

iv) Ensure responsible AI design for automated SME GHG accounting: SME GHG accounting software should adhere to a set of ethical standards including transparency of accounting methodologies and explainability so that SMEs understand how their emission estimates are generated and have options to challenge results. There is also the need for a degree of human oversight which can partly come from financial supervisors auditing the GHG algorithms. A key question is around data ownership of the SME GHG footprint. If solution type 1 is leveraged based on SME uploaded data, the ownership of the GHG account falls to the SME, but for solution types 2 and 3 based on more sophisticated algorithms data ownership depends on jurisdictional data regulation.

⁶ The Legal Entity Identifier (LEI) initiative is designed to create a global reference data system that uniquely identifies every legal entity or structure, in any jurisdiction, that is party to a financial transaction (LSEG 2024).

The G20 should work on identifying data regulations which enable data governance to the benefit of competition while ensuring not to lock-in SMEs to one financial service provider long-term.


v) Catalyse innovative automated SME GHG accounting solutions: To foster innovative solutions, the G20 should focus the fifth or sixth edition of the G20 TechSprint series on catalysing innovations in AI-enabled SME GHG accounting solutions. A TechSprint set up to source innovations from a broad group of jurisdictions will enable a better understanding of differences in solutions per underlying data infrastructure.

Scenario of Outcome

The availability of automated carbon accounting options will increase in the number of SMEs that produce carbon accounting reports. This will help them to better achieve emissions reductions and realise cost savings through energy efficiency measures. SMEs will be aware of ways to change production practices to save energy and will make investments in energy efficiency enabling them to experience positive cash flows to pay back energy efficiency investments and loans. It creates a clear first step on the SME just energy transition pathway (Anzboeck and Couzinet 2014).

SMEs will be able to provide GHG performance data which enables them to tap into transition finance, possibly at reduced rates. Banks can use the GHG data to reimagine lending to SMEs and develop green and transition linked finance products for SMEs. Banks perceive SME energy efficiency and renewable energy finance as a market opportunity as access to automated GHG accounting data lowers their transaction costs and enables them to monitor energy KPIs of green and transition credit products in real time. Green and transition finance for SMEs will be perceived as an engine of profitable bank growth and banks will compete over SME clients, lowering SME cost of capital and increasing the supply of SME green and transition finance offerings. Furthermore, the usefulness of automated SME GHG data will stimulate fintech innovation communities to further improve how carbon input data can be generated and start to innovate ways to add product specific data to broad categories of sector expenditure-based carbon accounting. SMEs using increasingly accurate carbon footprint data can unlock access to new types of transition credit, and transition lending to SMEs scales rapidly.

As a result, SMEs will become not only greener but also more competitive and able to expand their participation in global value chains. Multinational corporation will be able



to access scope 3 GHG data from SME suppliers to disclose full supply chain carbon footprint, increasing the S2 voluntary reporting capabilities of multinationals as well as their ability to disclose on CSRD and other regulatory compliance standards. The SME suppliers' decarbonisation investments will help their corporate clients reach their decarbonisation targets. The improved profitability of supplier SMEs will increase, enabling them to further invest in clean production processes, improving their ecological footprint also beyond GHG emissions. For instance, SMEs will start to also look into how to improve their water use efficiency and overall water consumption as learnings from the carbon transition pathways have increased their awareness of the competitive advantages and efficiency gains associated with lowering climate and nature related negative impacts.

Jurisdictions with high adoption rates of automated carbon accounting among SMEs will increase their export earnings due to the development of supply chain relationships between multinational corporations and local SMEs. SMEs can negotiate better contractual conditions because they help the multinational corporations accomplish their net zero targets and because the SMEs help them lower carbon taxation, for instance taxation payments due to the European Union's Carbon Border Adjustment Mechanism.

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